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A synopsis for Ph.D. registration

On

A critical study of technological innovation in banking sector and its impact on customer satisfaction: A Case Study of Ranchi District

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1. Introduction

The banking sector in India plays an important role in the development of economy. This sector provides financial stability to the Indian economy. It also offers safe and secure transactions to its customers. The banking sector is emerging highly as this sector is affecting human life and their lifestyle. From earlier times there was always the necessity of this sector. These banks include both private banks and public banks. Earlier banks were only used to visiting banks to deposit money but because of numerous innovations in technology, banks can now provide different facilities to people which makes their banking transactions much more convenient, reliable and secure. Banks no longer restrict themselves to traditional techniques which are making them more competent in this global market.

The term " Banking Technology " refers to the use of information and communication technology (ICT) that makes it possible for banks to offer better services to their customers in a more secure and affordable manner. The introduction of Information Technology services by the banks has had a positive impact on their customers and has brought a revolutionary change in the operations of banks. Technological facilities like ATMs, mobile banking, internet banking etc. are introduced by banks for customers. These innovations in technology are changing the banking sector from paper to internet.[1]

1.1 Technological Innovations and Banking Industry

Technological adoption starts with becoming aware of the new technological innovation and then ends with trusting those new techniques and making full use of them. The rapid change in the business environment is the reason that has made the financial service sector introduce technologically based innovations in the banking sector. Information technology plays a vital role in enhancing the overall performance of any firm through innovations in products, channels and customer segments. Good innovations help the firm in a competitive environment.

The banking sector is an integral part of the service industry and to remain in this competitive environment the banking sector has also introduced technology in banking proceedings to provide the best services to its customers. These technologically based services in the banking sector are mainly self-service technologies. Self-service technologies refer to those technologies that can be operated by the customer and do not need any assistance from the firm's employees.

1.2 Various forms of technological innovations

It describes the various innovations that are technological based and are adopted by the banking industry to facilitate their banking services and make it more accessible, reliable and secure. Following are the various technological innovations that have transformed banking into electronic banking.

[1] https://www.igi-global.com/chapter/introduction-modern-banking-technology-management/46233

(i) **ATMs** - ATM stands for Automated Teller Machine that are self-service devices that help the customer to withdraw money, check balance, or even transfer funds. In India first ATM was setup by HSBC bank in 1987. ATM transactions are either free or bear nominal charges depending on different types of banks. There are mainly two types of ATMs: - one that is simple device used for cash withdrawal, balance check, generating or changing pin, get mini statements and accounts update. The other complex device also provides transfer of funds and cash deposits along with the above-mentioned services. These ATMs provide us accessibility and convenience as they help people when they are in urgent need of cash and there is no bank branch nearby. People are not dependent for cash withdrawal from banks as we can withdraw cash even on bank holidays or after work timings.

(ii) **Mobile Banking** - Mobile or phone banking services are provided by banks or financial institutions to their customers to perform financial transactions using mobile devices that can be a smart phone or tablet. Mobile banking is different from internet banking in so many ways as these services require applications that are provided by financial institutions. Also, these financial transactions from mobile banking have some limitations on the amount that can be transacted. Mobile banking is very useful as it provides 24 hrs. services and cashless transactions. Customers do not need to visit ATMs or branch banks for cash, which also reduces their travelling costs. To perform the transaction from mobile banking the customer should have a smart phone, access to internet and the required applications.

(iii) **Net Banking** - Net banking, which is also known as internet banking, is another digital facility that is provided to perform most of the banking transactions or other activities related to banking at home without going to branch bank. It is an electronic system that helps any individual who has a bank account to use it for their banking proceedings. A bank customer can have access to their bank account through any internet enabled devices such as laptop, computer desktop or mobile phone. The bank customer need not have to visit the branch bank for any fund transfer to any other bank account, to check their transaction statement or to ask any transactions related queries. This net banking facility enables the customers to even open their new bank account digitally. All these facilities provided by net banking have created an effective impact on its customers.

(iv) **Card Based Payment System**- Payment cards are issued by the financial institutions to those customers who have activated their accounts in those particular banks. These card holders can withdraw cash or make direct payment through these payment cards. There are different varieties of cards but the most commonly payment cards that are used are debit cards, credit cards and prepaid cards.

(v) **National Electronic Fund Transfer (NEFT)** – National Electronic Fund Transfer or (NEFT) helps in one-to-one digital bank transactions between people, groups or businesses. If the bank accounts of both receiver and depositor are NEFT enabled, then they can easily transfer money to the other account even if both accounts don't belong to the same bank. The good thing is through NEFT there is no minimum or maximum amount for transactions whereas if we have to make payment through cash by withdrawing from any ATMs then the maximum amount is Rs 50,000. Transactions through NEFT is mostly used by businessmen as they have to make big transactions more frequently.

(vi) **Real Time Gross Settlement (RTGS) -** Real Time Gross Settlement (RTGS) is another system for payment and settlement. It refers to the transfer of high value transactions from one bank account to another. The minimum amount that can be transacted through RTGS is Rs 2,00,000 and there is no maximum limitation. The term real time means that the moment the receiver receives the amount, the transaction is settled thereafter. The RTGS systems are used for large amount transactions and are operated by the country's central bank. RTGS systems are used by central banks worldwide and provide riskless high value payment transactions.

(vii) **Satellite Banking –** Satellite banking is the upcoming technological innovation that will help to create a network between banks in remote and hilly areas where people are still facing problems related to banking transactions. It refers to the use of technology, that is satellites to provide banking facilities in remote areas and hilly areas. This can include banking facilities like mobile banking, internet banking and ATMs services. The use of satellites is for establishing connecting networks between branches of banks to provide better banking facilities to people living in these remote areas.[2]

1.3 Role of Technological innovation in Banking Sector

Technology has taken the banking sector to a level of greater transformation. The introduction of computers and other electronic devices has made it possible for customers to do banking transactions and other services related to banks in an easier way. The impact of technology is on all sectors and in our daily life but the impact that it has created in the banking sector has transformed the lives of people to another level. Banks can now provide financial related services to customers without letting them go to the branch bank. With the help of these technological innovations, banks can now provide financial services to their customers that are easy to access, low service costs and high speed of service.

[2] https://www.softwaregroup.com/insights/blog/article/10-innovations-that-deliver-the-digital-banking-of-the-future-today

Technological innovation has played a very significant role in the development of banking sector by providing various e-banking services and secured transactions. Here are some key roles of technological innovation in banking sector:

A. **Improved customer experience**

With the help of technology in banking sector customers are getting better banking services that is improving their customer's satisfaction and also improving their experience as compared to their previous experience. Banks are able to provide secured transactions with the help of technology which provides their customers better experience.

- **Online Banking:** Technological innovation has made it possible for the customers to get the benefits of online banking that includes various banking services like mobile banking and net banking which allows the customers to do online payment, fund transfer, check their balance account and perform various banking activities online.
- **Mobile Banking Apps:** The introduction of various mobile banking apps like Google pay, Phone pay, Paytm and so on has made it more easier for their customers to transfer funds, make online payments, check account balance and even to check their deposits using smartphones whenever and wherever they want using internet. This facility has helped banks to provide baking services facilities more efficiently.
- **Chatbots and AI powered customers services:** With the help of chatbots and AI powered customer services, banks are able to provide quick and efficient customer support services that will help the customers with transaction and bank related any queries.

B. **Enhanced Security**

Technological innovation has played a crucial role in enhancing security in banking sector. As banks face threats from cybercrimes and frauds, they adopt innovative technologies to protect their customer's bank details and the overall banking system.

- **Biometric Authentication:** This technology uses facial recognition and fingerprint scan to authenticate the real bank account holder. This technology is helpful in online banking, mobile banking, ATMs.
- **Two factor Authentication:** This is a security system which has two different ways of checking the security authentication of the customer. One is the password and the other is usually a form of text which is a code that is sent on the mobile number of the account holder known as one- time password (OTP). This two -factor authentication is very helpful in providing an effective security base in the banking sector.

C. **Cost Reduction**

Another role of technological innovation in banking sector is the cost reduction. With the adoption of technological innovation, banks have got the benefit of cost reduction in their operational cost. Technological based innovations such

as automatic teller machine, credit cards, AI driven chatbots and virtual assistance has made a great impact on the overall operational cost of banks.

D. **Digital Payments**

Technological innovation has played a vital role in changing the way of making payments. The transactions made by people and businessmen through digital are more fast and secure. Digital payment has made it possible to make cashless payments and without going to branch banks for making payments. With the help of digital payments one can transfer fund to another account in a secured way.

Thus, the researcher has gone through the role of technological innovation in banking sector so, that is why it is very important and now the researcher is carrying out research on "A critical study of technological innovation in banking sector and its impact on customer satisfaction". In which researcher is considering the role of technological innovation in the banking sector and its impact on customer satisfaction.

2. Review of Literature

Seema Malik (2014)[3] has conducted the study on "Technological Innovations in Indian Banking Sector: Changed face of Banking". In which objective of the study was to focus on how the technology has transformed the face of banking in India. This paper focuses on the benefits of various innovations in banking and financial sectors and the challenges that are faced by the changing banking trends. She concluded that the need of the hour is to design such a system that will encourage more to invest in technological innovations in banking and financial sectors and widens the gap between revenues and costs involved.

Kamaleshwar Boro (2015)[4] has conducted the study on "Prospects and Challenges of Technological Innovations in Banking Industry of North East India". The objective of this paper was to study the prospects and challenges of technological innovations in banking sectors like ATMs, credit cards, debit cards, internet banking, mobile banking, RTGS, ECS and mobile wallet in Northeast India. For the primary data, in-depth interviews were taken from 50 bank respondents to examine the issues, prospects and challenges that are faced by these technological innovations. The conclusions of his study were that young customers were found more active in using E-banking. Also, it was found that among all the above-mentioned technological innovations, ATM is the most common technological medium used by maximum customers and are aware of this medium as compared to other technological mediums such as PC banking, mobile banking, credit cards, mobile wallet, RTGS and NEFT.

[3] Malik, S. (2014). Technological innovations in Indian banking sector: changed face of banking. International Journal, 2(6), 45

[4] Boro, Kamaleswar. (2015). Prospects and Challenges of Technological Innovation in Banking Industry of North East India. The Journal of Internet Banking and Commerce. 20. 10.4172/1204-5357.1000134.

Abdul Muntakim Khan and Dr. Manoj Kumar Sahoo (2022)[5] has conducted the study on "Innovative Banking Products in the Indian Banking Sector". Their objective of study was to investigate the history of Indian banking sector and to examine the various innovative products there were introduced in banking sector. They gave the conclusion that with the introductions technology-based banking, the Indian banking industry will see a dramatic change from the seller market to the consumer market.

Megha Jain and Dr. G.S. Popli (2012)[6] has conducted the study on "Role of Information Technology in the development of Banking Sector in India". Their objective of study was to examine the progress of use of computerization in all the public sector banks of India. Their focus was on how many public sector banks of India has shifted from traditional to technological based banking through computerization. Under their study they also analyzed the progress of use of ATMs in all the public sector banks in India and to identify the challenges coming on way while adopting these technological based banking. The conclusion of their study was that Indian banking sector is gaining after the implementation of computerization-based banking. By designing simple, safe and secure mediums of banking, this industry is reaching the common public with the objective of customer satisfaction.

Bright Ameme and Joseph Wireko (2016)[7] conducted the study on "Impact of technological innovations on customers in the banking industries in developing countries". The objective was to study the impact of new innovations in technology in financial institutions and what are its effect on customers satisfaction in the Ghanaian banking industry and to examine the impact of these technological innovations on customer cost of transactions of banking in Ghana. They concluded that banks need to focus on their target customers in developing new electronic products and services so that they can provide better services to their customers that will help these banks to retain these customers. They also suggested that to reduce customer attrition caused due to the high cost of banking transactions, banks should introduce cost-effective technological innovations to increase their profitability and at the same time satisfy their customers.

Dr. G P Sharma and Harsha Sharma (2017)[8] conducted the study on "Innovative Banking Practices by Indian Banks: A study of State Bank of India". The objective of

[5] Khan, A. M., & Sahoo, M. K. Innovative Banking Products in the Indian Banking Sector–A Study.
[6] Jain, Megha and Popli, Gurmukh Singh and Popli, Gurmukh Singh, Role of Information Technology in the Development of Banking Sector in India (September 24, 2012). Available at SSRN: https://ssrn.com/abstract=2151162
[7] Ameme, B., & Wireko, J. (2016). Impact of technological innovations on customers in the banking industry in developing countries. The Business & Management Review, 7(3), 388.
[8] Sharma, G. P. & Sharma, Harsha (2017) Innovative Banking Practices By Indian Banks: A Study Of State Bank Of India, International Journal of Economic and Business Review, 5(2), pp.131-136.

this study was to examine the various technology enabled products and services provided by State Bank of India. SBI has the largest share in the public sector banks that pioneer in providing new innovative products to its customers. To remain in the market banks, need to keep updating their way of doing banking activities. Nowadays customers are shifting more towards modern techniques of banking as compared to traditional ones. They gave the conclusion that with the increase in innovation in the banking sector there is also an increase in economic development. The banks can increase their market share with the adoption of IT in the banking sector. IT has promoted paperless work which has supported sustainability measures. SBI is a bank that provides tremendous services through online website portals. Banks provide various technology enabled services that help customers in saving time and cost.

Mr. Rupesh kumar Babulal Solanki and Dr. A Kumar (2023)[9] conducted the study on "Technology Adoption in Banking Sector – Issues and Challenges". The objective of the study was to examine the various challenges and difficulties that are faced by their customers from the adoption of e-banking services. As banking are able to provide various facilities that is making banking services to be more effective and efficient. Bank customers are using these innovative technologies that are cost effective and also time effective. But with the adoption of technologies in banking sector there comes some disadvantages too. This study has focused on the various issues that has occurred due to the adoption of technology in banking sector. The conclusion of this study was that adoption of technology in banking sector is helpful in transforming banks into branch less, contact less, paperless, card less and it is important for all the banks to adopt new technologies in order to remain in the competitive market. But every new technology adoption has its pros and cons and similarly technological adoption in banking sector has its own pros and cons. The customers who are using such e-banking services should be aware of the technologies properly and should educated on security features for improving better customer satisfaction.

Ruzita Abdul-Rahim, Siti Aisah Bohari , Aini Aman and Zainudin Awang (2022)[10] conducted the study on "Benefit–Risk Perceptions of FinTech Adoption for Sustainability from Bank Consumers' Perspective: The Moderating Role of Fear of COVID-19". The objective of this study was to examine as how the benefit and risk of FinTech are affecting FinTech adoption behavior during the COVID-19 pandemic. There are so many benefits that fintech has provided to banking sector like cashless transaction, online lending, digital banking and so many other e- banking facilities but at the same time it also involves various risks like frauds and scams, cybersecurity risks, privacy concerns and many more which affects the adoption of FinTech services. Along

[9] Solanki, R. B. ., & Kumar, A. . (2023). Technology Adoption in Banking Sector – Issues and Challenges. GLS KALP – Journal of Multidisciplinary Studies, 3(3), 12–20. Retrieved from https://glskalp.in/index.php/glskalp/article/view/60

[10] Abdul-Rahim, R.; Bohari, S.A.; Aman, A.; Awang, Z. Benefit–Risk Perceptions of FinTech Adoption for Sustainability from Bank Consumers' Perspective: The Moderating Role of Fear of COVID-19. Sustainability 2022, 14, 8357. https://doi.org/10.3390/ su14148357

with this another objective was to examine whether this FinTech adoption is contributing anything to sustainability or not. The conclusion of this study was that, the adoption of technology in banking sector during pandemic was more because of the fear of covid. There is impact of fintech on sustainability due to cashless society and digital economy which is ultimately developing our economy.

3. Research Gap

As the researcher has reviewed many Journals, Books, Articles and had found out that banking sector has become an emerging sector in India as this sector is providing a lot of services to the customers that are affecting to the human life and their lifestyle. Banks are becoming a necessity for everyone. By the adoption of technical enabled banking services, customers are getting various advanced services. Lot of work has been done on customer perception and service quality, but no work has been done on the impact of innovative products and its effect on customer satisfaction in the Ranchi district of Jharkhand state. The study will focus on all the aspects of innovative products and their services, customer satisfaction and enhancement of banking services towards customers in India in general and Ranchi district in particular.

4. Objectives of the study

- To study about the various available and forthcoming technology enabled innovative products and their scope in banking sector in India.
- To analyze the customer's perception towards technology enabled banking services.
- To evaluate the awareness on the technology enabled banking services in Ranchi district related customers.
- To analyze the customer's satisfaction with technology enabled banking services in Ranchi district related customers.
- To study the problems faced by customers and suggest measures to improve the customer service quality.
- To study the impact of adoption of technology-based innovations in banking sectors towards the customers of Ranchi district.

5. Significance of the study

The use of technical innovation has helped the banking sector to go beyond to its traditional ways and adopt new modern ways which will bring satisfaction to its customers by providing technology-enabled services in a more secure, reliable and efficient way. With the help of these technology enabled services, banks are now able to interconnect their computer systems not only across branches in a city but also to other geographical locations. Now customers' expectations are also increasing, they are expecting high speed services without any technical glitch. Customers demand

banking services anywhere and anytime without much transactional costs. So, there is a need to look that how many customers are relating to this technology enabled services and what are the problems that are faced by customers. As such there is a great need to focus more on this aspect.

6. Hypothesis of the study

H_{01}: There is no significant difference in customer satisfaction level on the usage of technology-enabled banking services.

H_{11} : There is significant difference in customer satisfaction level on the usage of technology-enabled banking services.

H_{02}: There is no significant difference between the various banks in taking preventive measures against electronic banking frauds.

H_{12} : There is significant difference between the various banks in taking preventive measures against electronic banking frauds.

7. Research Design and Research Methodology

7.1 Research Design

This research has both quantitative and qualitative factors such as effectiveness, efficiency and other attributes on the impact of these innovative products reference to banking sector in Ranchi district.

Quantitative Research

Quantitative research is based on quantitative measurements. This research involves collection, analysis and presentation of numerical data and then finding out the correlation, patterns and other statistical relationships. Quantitative research will be used to find out the impact of technological innovation in banking sector on customers satisfaction. Relationship between the independent variable and dependent variables that are adoption of technological innovation and its impact on customer satisfaction will be examined. Under this quantitative research can be used in the following ways:

- Surveys and Questionnaires: Under this structured questionnaire will be designed to gather the data from those customers who have bank accounts. Questions will be designed to collect the data regarding their awareness, usage, challenges and difficulties regarding various e-banking services that are provided to the customers.
- Data Analysis: To analyze the collected data various statistical tools will be used to find out the relation between variables. Statistical tools like correlation and regression analysis methods will be used to find out the relationship between variables that are between technological-based innovative products (phone

banking, mobile wallet, card payment systems etc.) and its impact on customer satisfaction.

- Comparative studies: Comparative studies can be used to study the difference in customer perception before and after the implication of any specific innovation which will help in finding out the impact of technological based innovation in banking sector.

Qualitative Research

Qualitative research is based on seeking in-depth understanding of social phenomena. Under this research customer's perception, opinion, expectations will be taken into consideration to find out the impact of technological-based innovations in banking sector. This type of research will be beneficial to find out the outcomes of non-numerical data. Qualitative research can be used in the following ways:

- Focus groups: focus group discussions will encourage the customers to share their experiences and opinions regarding e-banking services
- In-depth interview: In depth interview provides open-ended questions in order to find the true opinions of customers. This method will be used to make open-ended questions to examine the customers perception and satisfaction regarding technological-based innovative products in banking sector.
- Case Studies: This method will be used to study any specific technology adoption in banking sector and to study about its implications, advantages, challenges and difficulties that occurred.

To fulfill the research objective, this research is based on two surveys: one towards the current and forthcoming innovative products in banking sector and the other is to focus on the target customers about their perception and satisfaction level towards these innovative products.

To measure the input provided by the banking professionals, survey questionnaires will be designed using close-ended questions. The questionnaires will be designed to gather the information relating to numbers of customers using these technology-based banking facilities with respect to different age groups and genders, their perception regarding these innovative products, their satisfaction level towards these innovative products and what are the challenges that are faced by customers due to these innovative products.

Each question will be designed to gather information related to the objective of this research. The following will be the objectives of the questionnaires:

- To gather the general information about respondents, his/her bank and business environment and other characteristics.
- To gather information about adoption, barriers, challenges and benefits of adopting these technological based innovative banking services.

7.2 Research Methodology

This study will examine the impact of technologically based innovative products in the banking sector and the effect on customers satisfaction in the Ranchi district of Jharkhand state. This study is descriptive and analytical in nature.

Target population

This research is exploratory research in nature since it focuses on finding out the efficiency, effectiveness, their performance and other attributes of these innovative products in banking sector in reference to Ranchi district of Jharkhand state. The target population of this study are all those customers who have bank accounts and are using technologically based banking services like ATMs, mobile banking, internet banking etc. in their day-to-day life who are residing in the Ranchi district of Jharkhand state.

Sample

Sample Design

The population will consist of all the customers who reside in Ranchi district and have a bank account in any of the private or public sector banks. For sampling the respondents will be selected based on non-probability sampling method that is convenient sampling method. Respondents of different age groups and genders will be selected.

Sample Size

The size of the sample will be approximately 300 customers who reside in Ranchi district and are using e-banking services. These customers will include all those who have bank accounts in both private and public sector banks.

Sampling Method

For the purpose of this study, the non-probability method of convenient method of sampling will be used to gather information of customers perception and satisfaction by using e-banking services from those accounts holders of will be having bank accounts in both private and public sector banks. The area of study is limited to Ranchi district of Jharkhand state.

Methods of Data Collection

Source of Data

The purposed study will be analytical in nature and hence both primary and secondary data will be used to justify the objectives of the study.

Primary Data

The primary data will be collected to examine the impact of innovative products in banking sectors and to analyze customer satisfaction while using e- banking services. To collect the primary data both online and offline methods will be used such as structured questionnaires and personal interviews will be conducted.

Personal Interviews

This is one of the offline methods of collecting primary data which focuses on those target customers who are not comfortable with the online methods of collecting data. Structured open-ended questions will be prepared for personal interviews to gather the information regarding customers perception and satisfaction and also what are the challenges that are faced by them on adoption of e-banking services.

Questionnaires

This is one of the online methods of collecting primary data. A well-designed structured questionnaire will be prepared for the respondents in which there will be close ended questions.

Secondary Data

The secondary data will be used to study the various present and forthcoming innovative products that the banks are introducing to enhance their banking services. The secondary data will be collected from different relevant published and unpublished sources.

Methods of Data Analysis

Tools and Techniques

Different mathematical tools and statistical tools will be applied to find out the results of the objectives of this study. Mathematical tools like percentage and average will be applied as well as statistical tools like mean, chi-square test, F- test, factor analysis, correlation, regression etc. will be used wherever it fits to data. These methods will be used to analyze the data that has been collected and to examine the relationship between variables.

Methods of Data Presentation

Various methods of data presentation will be used to show the diagrammatical presentation of the outcomes. These diagrammatic presentations of data will help to communicate the results effectively. The choice of method will depend on the type of data that has been collected. The various methods of data presentation are: tables, bar charts, line charts, pie charts and so on. This data presentation methods will be used to show the outcomes of responses given by customers on various questions related to technological-based banking services.

8. Limitations of the Study

- The study will be focused on the Ranchi district of Jharkhand state to examine the technology enabled services.

- The collected data will be based on personal interviews and questionnaires; hence responses may vary.
- The study will be conducted for a limited period which may or may not be relevant for the future.
- Convenience sampling method of non-probability sampling method will be used to collect the data, that can create the problem of generalization.
- Non-sampling errors may occur due to the use of limited sample size.
- The study will be based on perceptions and satisfaction of customers using e-banking services and we know that perception and satisfactions changes from time to time.

9. Tentative Chapterization

Chapter 1: Introduction and Review of literature

Chapter 2: Customers perception towards technology enabled banking services

Chapter 3: Awareness of technology enabled banking services among customers

Chapter 4: Customers satisfaction on the usage of technology enabled banking services

Chapter 5: Impact of technology banking services on the investment growth of banks

Chapter 6: Hypothesis testing and Data analysis

Chapter 7: Findings, suggestions and conclusions

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